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IMPACT OF CONTRAST ECHOCARDIOGRAPHY ON ICU PATIENT OUTCOMES AND HEALTHCARE RESOURCE UTILIZATION

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Background: Intravenous contrast enhanced transthoracic echocardiography (cTTE) improves image quality when baseline non-contrast echo exams (nTTE) are suboptimal. However, clinical and healthcare resource outcomes data are lacking. This study compared the impact of contrast echo (cTTE) vs. nTTE on post echo total hospital and ICU length of stay (LOS), overall cost, cardiac function test cost, number of cardiac function tests, and mortality among ICU patients.

Methods: Deidentified data was extracted from the Premier hospital database for all ICU patients receiving either cTTE with DEFINITY® or nTTE between 01 Jan 2002 and 31 Dec 2009. cTTE patients were matched to a control group of nTTE patients using propensity score matching, yielding two groups each with 16,222 patients. LOS was analyzed using multivariate negative binomial regression, cost was analyzed using multivariate gamma regression with adjustment for annual healthcare inflation, and number of cardiac function tests was analyzed using Poisson regression. Mortality was analyzed using multivariate logistic regression.

Results: cTTE patients were significantly less likely to die during hospitalization (Odds Ratio 0.925, CI 0.865-0.989; p=0.0228) than nTTE patients. 48-hour mortality post TTE trended towards improved cTTE survival (Odds Ratio 0.914, CI 0.795-1.050; p=0.2032). Post TTE patients showed no significant statistical difference in LOS (1.0058 day, CI 0.9877-1.0242; p=0.5316), ICU LOS (1.0117 day, CI 0.9853-1.0387; p=0.3891), hospitalization cost ($1.0242, CI 0.9978-1.0514; p=0.0728) and cost of cardiac function tests ($1.0432, CI 0.9976-1.0909; p=0.0653). In comparison with nTTE, cTTE patients had significantly lower number of cardiac function tests post TTE (-0.0959 test, CI -0.1152-[-0.0766]; p<.0001). The absolute risk reduction (14.68% [nTTE] - 13.75% [cTTE]) was 0.93%, which translates into a number needed to treat of 107 patients per life saved.

Conclusions: cTTE patients had significantly lower likelihood of inpatient mortality than nTTE patients, while costs of care and LOS showed no significant differences. The number of cardiac function tests post TTE was significantly lower for cTTE patients.